CLAIMS

We claim:

1. A chemical heat source comprising:

a heat chamber having an elongated shape, an open end, and a closed end;

an abutment disposed at the closed end of the heat chamber;

a heat cartridge disposed at the open end of the heat chamber, the heat cartridge having a closed end and an end including an aperture therein, the heat cartridge comprising a chemical agent capable of undergoing an exothermic reaction upon exposure to a liquid;

a frangible partition disposed between the heat cartridge and the abutment; and

an activating solution disposed between the frangible seal and the closed end of the heat chamber.

2. The heat source of claim 1 wherein the heat source is activated by pushing the heat cartridge beyond the frangible partition to release the activating solution through the aperture of the heat cartridge.

3. The heat source of claim 2, wherein the abutment prevents the heat cartridge from penetrating the closed end of the heat chamber.

4. The heat source of claim 2, wherein the heat cartridge reaches a temperature of at least about 100°C within one minute of activation and maintains a temperature of over 100°C for at least about five minutes.

5. The heat source of claim 1, wherein the abutment is a stopper in contact with the closed end of the heat chamber and having a length, and the frangible partition is disposed a distance from the closed end of the heat chamber wherein the distance is greater than the length of the stopper.

6. The heat source of claim 5, wherein the stopper stops the heat cartridge at a distance, equal to the length of the stopper, from the closed end of the heat chamber when the heat cartridge is pushed past the frangible partition.

7. The heat source of claim 1, wherein the abutment is between about 15% to about 20% of the length of the heat chamber and is disposed at the closed end of the heat chamber.

8. The heat source of claim 1, wherein the abutment comprises a tube.

9. The heat source of claim 1, wherein the abutment comprises a tube fragment.

10. The heat source of claim 8, wherein the abutment is comprised of a polyester film.

11. The heat source of claim 1, wherein the heat chamber is comprised of polypropylene and wherein the heat chamber can withstand temperatures of at least about 200°C.

12. The heat source of claim 1, wherein the heat cartridge comprises a chemical compound capable of producing heat.

13. The heat source of claim 12, wherein the chemical heat compound comprises a metallic alloy.

14. The heat source of claim 12, wherein the chemical compound comprises magnesium and iron.

15. The heat source of claim 1, wherein the frangible partition comprises wax or polymeric film.

16. The heat source of claim 1, wherein the activating solution comprises potassium chloride and potassium nitrate.

17. The heat source of claim 1, wherein the aperture of the heat cartridge is disposed towards the closed end of the heat chamber.

18. The heat source of claim 1, wherein an outside diameter of the heat cartridge and an inside diameter of the heat source are selected such that after the heat source is activated, the heat cartridge expands such that a seal is formed between the heat cartridge and the heat chamber sufficient to allow pressure to build-up in the closed end of the heat chamber.

19. A smoking article comprising:

tobacco; and

a chemical heat source comprising;

a heat chamber having an open end, a closed end, and a length;

an abutment having a length disposed at the closed end of the heat chamber;

a heat cartridge disposed at the open end of the head chamber having a closed end and an end including an aperture therein;

a frangible partition disposed between the heat cartridge and the abutment; and

an activating solution disposed between the frangible seal and the closed end of the heat chamber.

20. The smoking article of claim 19 wherein the heat source is activated by pushing the heat cartridge beyond the frangible partition to release the activating solution through the aperture of the heat cartridge.

21. The smoking article of claim 20, wherein the stopper prevents the heat cartridge from penetrating the closed end of the heat chamber.

22. The smoking article of claim 20 wherein the heat cartridge reaches a temperature of at least about 100°C within one minute of activation and maintains a temperature of over 100°C for at least about five minutes.

23. The smoking article of claim 19 wherein the frangible partition is disposed a distance from the closed end of the heat chamber wherein the distance is greater than the length of the abutment.

24. The smoking article of claim 23, wherein the abutment stops the heat cartridge at a distance, equal to the length of the abutment, from the closed end of the heat chamber when the heat cartridge is pushed past the frangible partition.

25. The smoking article of claim 19, wherein the length of the abutment is between about 15% to about 20% of the length of the heat chamber.

26. The smoking article of claim 19, wherein the abutment comprises a tube.

27. The smoking article of claim 19, wherein the abutment comprises a tube fragment.

28. The smoking article of claim 27, wherein the tube fragment is comprised of a polyester film.

29. The smoking article of claim 19, wherein the heat chamber is comprised of polypropylene and wherein the heat chamber can withstand temperatures of at least about 200°C.

30. The smoking article of claim 19, wherein the heat cartridge comprises a chemical compound capable of producing heat.

31. The smoking article of claim 30, wherein the chemical compound comprises a metallic alloy.

32. The smoking article of claim 31, wherein the metallic alloy comprises magnesium and iron.

33. The smoking article of claim 19, wherein the frangible partition comprises wax or polymeric film.

34. The smoking article of claim 19, wherein the activating solution comprises potassium chloride and potassium nitrate.

35. The smoking article of claim 19, wherein the heat chamber is surrounded by the tobacco.

36. The smoking article of claim 19, wherein the smoking article has two ends and further comprises a filter disposed at one end of the smoking article.

37. The smoking article of claim 19, wherein the tobacco is treated to reduce the volatilization temperature of the tobacco components.

38. The smoking article of claim 37, wherein the tobacco is in the form of a reconstituted tobacco sheet impregnated with a porous material.

39. The smoking article of claim 19, wherein the smoking article is a cigarette.

40. The smoking article of claim 19, wherein the smoking article is a cigar.

41. A smoking article comprising:

at least one volatile flavoring agent; and

a chemical heat source comprising:

a heat chamber having an open end, a closed end, and a length;

a stopper having a length disposed at the closed end of the heat chamber;

a heat cartridge disposed at the open end of the heat chamber having a closed end and an end including an aperture therein;

a frangible partition disposed between the heat cartridge and the stopper; and

an activating solution disposed between the frangible seal and the closed end of the heat chamber.

42. The smoking article of claim 41, wherein the at least one volatile flavoring agent surrounds the heat chamber.

43. A method of generating heat, comprising:

providing a heat chamber having a heat cartridge positioned therein;

pushing the heat cartridge toward a closed end of the heat chamber until the heat cartridge reaches a stopper;

puncturing a frangible partition, positioned a distance from the closed end of the heat chamber, to release an activating solution; and

exposing the heat cartridge to the activating solution.

44. The method of claim 43, wherein the heat cartridge comprises a metallic alloy.

45. The method of claim 43, wherein the heat cartridge comprises magnesium and iron.

46. The method of claim 43, wherein the activating solution comprises potassium chloride and potassium nitrate.

47. The method of claim 43, wherein the heat cartridge reaches a temperature of at least about 100°C within one minute of exposure to the activating solution.

48. The method of claim 47, wherein the heat cartridge maintains a temperature of at least about 100°C for at least about five minutes.

49. The method of claim 43, wherein the frangible partition is punctured by the heat cartridge, being pushed with a pushrod toward the closed end of the heat chamber.

50. A method of generating heat, comprising:

providing the chemical heat source of claim 1;

pushing the heat cartridge through the frangible partition, toward the closed end of the heat chamber;

contacting the activating solution with the heat cartridge.

51. The method of claim 50, wherein the heat cartridge comprises a metallic alloy.

52. The method of claim 50, wherein the heat cartridge comprises magnesium and iron.

53. The method of claim 50, wherein the activating solution comprises potassium chloride and potassium nitrate.

54. The method of claim 50, wherein the heat cartridge reaches a temperature of at least about 100°C within one minute of initiating contact with the activating solution.

55. The method of claim 54, wherein the heat cartridge maintains a temperature of at least about 100°C for at least about five minutes.

56. The method of claim 50, wherein a pushrod pushes the heat cartridge through the frangible partition, toward the closed end of the heat chamber.

57. A method of heating tobacco in a smoking article, comprising:

providing a heat chamber surrounded by tobacco and having a heat cartridge disposed therein;

pushing the heat cartridge toward a closed end of the heat chamber until the heat cartridge reaches a means for stopping the cartridge a distance from the closed end;

puncturing a frangible partition, positioned a distance from the closed end of the heat chamber, whereby an activating solution is released; and

contacting the activating solution with the heat cartridge.

58. The method of claim 57, wherein the heat cartridge comprises a metallic alloy.

59. The method of claim 57, wherein the heat cartridge comprises magnesium and iron.

60. The method of claim 57, wherein the activating solution comprises potassium chloride and potassium nitrate.

61. The method of claim 57, wherein the heat cartridge reaches a temperature of at least about 100°C within one minute of contacting the activating solution.

62. The method of claim 61, wherein the heat cartridge maintains a temperature of at least about 100°C for at least about five minutes.

63. The method of claim 57, wherein the frangible partition is punctured by the heat cartridge being pushed with a pushrod toward the closed end of the heat chamber.

64. A method of heating tobacco in a smoking article, comprising:

providing the smoking article of claim 19;

pushing the heat cartridge through the frangible partition, toward the closed end of the heat chamber;

contacting the activating solution with the heat cartridge.

65. The method of claim 64, wherein the heat cartridge comprises a metallic alloy.

66. The method of claim 64, wherein the heat cartridge comprises magnesium and iron.

67. The method of claim 64, wherein the activating solution comprises potassium chloride and potassium nitrate.

68. The method of claim 64, wherein the heat cartridge reaches a temperature of at least about 100°C within one minute of initiating the reaction.

69. The method of claim 68, wherein the heat cartridge maintains a temperature of at least about 100°C for at least about five minutes.

70. The method of claim 64, wherein the frangible partition is punctured by the heat cartridge being pushed with a pushrod toward the closed end of the heat chamber.

71. The method of claim 64, further comprising allowing the heat cartridge to expand after contact with the activating solution, thereby forming a seal between the heat cartridge and the heat chamber to allow pressure to increase in the closed end of the heat chamber, whereby the pressure forces activating solution into the heat cartridge thereby maintaining increased temperatures generated by the heat source.